

DOCUMENT RESUME

ED 301 160

IR 013 500

TITLE Differences in Teachers' Instructional Use of Computers by School and District Factors. OERI Historical Report.

INSTITUTION Center for Education Statistics (OERI/ED), Washington, DC.

REPORT NO CS-86-220b

PUB DATE Jun 86

NOTE 6p.

PUB TYPE Statistical Data (110)

EDRS PRICE MF01/PC01 Plus Postage.

DESCRIPTORS *Computer Assisted Instruction; Computer Software; Educational Research; Elementary Secondary Education; National Surveys; Questionnaires; Sampling; *School Districts; *Socioeconomic Status; Teacher Education

IDENTIFIERS School Utilization Survey

ABSTRACT

This report provides information from the 1982-83 School Utilization Survey, and examines school district wealth, school socioeconomic status (SES), and grade level in relation to the computer software available to teachers for instructional purposes, as well as teacher training for instructional use of computers. Teachers with access to computers reported that their choices for instructional software were limited, with drill and practice software reported by most teachers, especially in elementary schools. Of the 938,000 teachers with access to computers, 62% used them for instruction, with the greatest use of computers for enrichment in special subject areas. No relationship appeared to exist between school SES and instructional use of computers, and in general, district size had no relationship to instructional purpose. On the other hand, teacher training was directly related to district wealth, with almost half (47%) of the teachers in the wealthiest districts receiving training, as compared with about one-third (32%) in the least wealthy districts. The relationship between wealth and computer training was also found at the school level. The text is supplemented by four tables. (EW)

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Contact: Janice Ancarrow
(202) 357-6397

June 1986

Differences in Teachers' Instructional Use of Computers, by School and District Factors

Computers and software for instruction are available in most school districts regardless of a district's size and wealth¹ or a school's socioeconomic status (school SES).² However, teacher training in computers is directly related to district wealth and school SES.

The data for this report come from the School Utilization Survey, 1982-83 (SUS 83).³ Co-sponsored by the Corporation for Public Broadcasting (CPB) and the Center for Statistics, this study is part of the cooperative research program on the availability, use, and support of instructional technology in the United States. District size and wealth, and school SES and grade level are examined in relation to (1) software available to teachers, (2) teachers' instructional purposes for computer use, and (3) teacher training in the instructional use of computers. Individual student use of computers was not examined in this survey.

Access to Computers for Teaching

In school year 1982-83, computers were in 94 percent of all school districts, ranging from a low of 91 percent in the smallest districts (under 2,500 students) to a high of 99 percent in the largest districts (over 25,000 students). Computers were in about 75 percent of all the Nation's schools. More computers were in senior high schools (99 percent of high schools had computers) than in middle/junior high schools (90 percent) or in elementary schools (70 percent).

Although computers were in most schools, less than half (44 percent) of all teachers reported having computers for use in classes. Classroom computers were available to

43 percent of elementary teachers, 47 percent of middle/junior high teachers, and 43 percent of senior high teachers.

Software for Instruction

Teachers with access to computers were asked about the instructional software available for their classes and reported that their choices were limited (table 1). Drill- and practice software was reported by most teachers (73 percent), especially in elementary schools (80 percent). Games software was available to about 67 percent of the elementary and middle/junior high teachers and 58 percent of the senior high teachers. About half of the teachers at all school levels said that software was available for tutorial purposes. Software for more advanced applications, such as graphics, word processing, programming languages, computation and statistics, and testing and evaluation, was more available to secondary teachers than to elementary teachers.

Teachers' Instructional Use of Computers, by School Level

Of the 938,000 teachers with access to computers, 62 percent used them for classroom instruction in the 1982-83 school year. In SUS 83, the greatest use of computers (combining and averaging across school levels) was for enrichment in special subject areas (59 percent), followed by challenging high achievers (47 percent), and teaching computer literacy (46 percent). Enrichment was the most frequent use in elementary school (65 percent) and middle/junior high (57 percent); however, in high school the most frequent use was for teaching computer literacy (45 percent). At the high school level, 34 percent of teachers used computers for regular instruction in specific subject areas for all students; and 26 percent for remedial instruction for regular classroom students. More high school teachers (34 percent) than elementary (15 percent) or middle/junior high (20 percent) used computers for word processing and advanced problem-solving. Computers were used to teach programming by 39 percent of high school teachers, 36 percent of middle/junior high teachers, and 17 percent of elementary teachers. This finding probably reflects the teaching of specific courses in business education and in computer science at higher grade levels.

¹Wealth of district is defined as per-pupil expenditure, excluding capital outlay.

²School socioeconomic status (school SES) refers to a school category determined by the median family income of the school's student body. The school SES is defined according to the highest proportion of students from families in the following income categories: Low (under \$10,000/year); low-middle (\$10,000-20,000/year); high-middle (\$20,000-40,000/year); and high (over \$40,000/year). School principals estimated the percentage of students from families in these four categories. In each school, the category having the highest proportion of students represented that school.

³Technical documentation about the SUS-83 survey design and methodology is in Burkheimer, G.J., *School Utilization III: Final Methodology Report*. Research Triangle Park, N.C.: Research Triangle Institute, October 24, 1983.

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Teachers' Instructional Purposes for Computer Use and School SES

No relationship appears to exist between school SES and instructional use of the computer (table 2). Only two instructional uses had statistically important differences. Computer use for teaching computer programming was reported by more teachers in the highest SES schools than in the lowest SES schools. "Other" instructional computer use was reported by more teachers in the lowest SES schools. No significant relationship was found between the kinds of software available and school SES, or district size and wealth. This finding must be interpreted cautiously, however, because of the small number of cases (54) in the lowest quartile and the related high standard errors.

Teachers' Instructional Purposes for Computer Use and District Size and Wealth

In general, district size had no relationship to instructional purpose. One significant difference was that the smallest districts, under 2,500 pupils, provided more challenge use for high achievers than did the largest districts of 25,000 pupils or more (table 3).

No relationship was found between district wealth and instructional purpose. The only significant difference was that the least wealthy districts reported the highest percentage of use for enrichment in specific subject areas (table 4).

Teacher Training in the Instructional Use of Computers

Teacher training in computers was directly related to district wealth. Almost half (47 percent) of the teachers in the wealthiest districts received training compared to about one-third (32 percent) in the least wealthy districts. The relationship between wealth and computer training was also found at the school level, with about 43 percent of teachers in the middle and highest SES schools reporting training compared to 28 percent in the lowest SES schools. Seventy-seven percent of the teachers with computer training used the technology with their classes. Ninety percent of the teachers in this survey said they wanted more training in the instructional use of computers.

Methodology

Overview of Study Design

The SUS 1982-83 sample design called for a sample of classroom teachers, schools, and school districts. The sampling procedure was designed to ensure that every teacher in public school districts and Catholic dioceses with enrollments of 300 or more had an opportunity to be selected for participation in the study. Investigation in Catholic dioceses was restricted, however, to elementary school teachers. A stratified multistage probability sample was used, involving (1) selecting a sample of school districts with probability proportional to size (PPS), using number of teachers as the size measure; (2) selecting a sample of schools (to desired levels of elementary, middle/junior high,

and senior high) in selected districts; and (3) selecting a sample of two teachers in each selected school.

The final SUS 1982-83 sample sizes are shown below:

Districts/dioceses	619
Schools	1,350
Elementary	675
Middle/junior high	338
Senior high	337
Teachers	2,700
Elementary	1,350
Middle/junior high	676
Senior high	674

The SUS 1982-83 survey was conducted by mail questionnaire, with telephone follow-up interviews of non-respondents. Survey questionnaires were developed to gather information at three levels: a Superintendent Questionnaire for district-level data, a Principal Questionnaire for school-level data, and a Teacher Questionnaire for classroom-level data. Data were collected from February to May 1983. Final response rates for the three questionnaires were: 86 percent for superintendents, 84 percent for principals, and 80 percent for teachers (2,160 teachers).

A sampling weight was assigned to each member in the original sample to account for unequal selection probabilities; these weights were further adjusted for instrument nonresponse. These adjusted weights were then used for estimating results for the total populations of superintendents, principals, and teachers. Three categories of school level were defined: elementary schools, schools with a lowest grade of less than 6, including K-8 or K-12; senior high schools, schools with a lowest grade of greater than 8; and middle/junior high schools, all other schools. Special schools, such as special education, adult education, vocational/technical, and alternative/continuation education were excluded from this study.

Reliability of Estimates

The findings in this report are estimates based on the particular sample used and consequently are subject to sampling variability. If the questionnaires had been sent to a different sample, the responses would not have been identical; some numbers might have been higher, while others might have been lower. The estimated standard error of a statistic (a measure of the variation due to sampling) can be used to examine the precision obtained in a particular sample. If all possible samples were surveyed under similar conditions, intervals of 1.645 standard errors below a particular statistic to 1.645 standard errors above would include the average result of these samples in about 90 percent of the cases. Specific statements of comparison in the text are significant at the 90 percent confidence level or better.

For More Information

For more information about this analysis and the School Utilization Study, 1982-83, contact Janice S. Ancarrow, Center for Statistics, U.S. Department of Education, Washington, D. C. 20208, telephone (202) 357-6397.

**Table 1.—Percent of teachers reporting types of computer software available for instruction, by school level:
School year 1982-83**

Types of software	Total ¹	School level		
		Elementary	Middle/ junior high	Senior high
(In percent)				
Drill and practice	73	80	73	58
Tutorial	50	49	56	47
Simulation	33	31	39	33
Games	64	67	63	58
Languages for programming	25	19	31	32
Graphics	30	26	34	37
Word processing	30	24	28	47
Computation or statistics	27	22	33	34
Testing and evaluation	19	16	21	26
Other	8	9	4	8
Number of sample cases	846	437	211	198
Estimated population size ²	938,000	498,000	217,000	223,000

¹Analysis restricted to teachers with computers available.

²The standard errors for the percentages of teachers with software available are: elementary teachers, 1.6; middle/junior high school teachers, 1.5; and senior high school teachers, 1.3.

**Table 2.—Percent of teachers reporting computer use, by instructional purpose and school SES:
School year 1982-83**

Purposes for computer use	Total	Median family income of school (SES)		
		Lowest quartile	Middle quartiles	Highest quartile
(In percent)				
Remedial instruction for regular classroom students	43 (± 5.7)	34 (± 15.5)	46 (± 7.1)	43 (± 12.5)
Regular instruction in specific subjects for all students	43 (± 5.7)	42 (± 16.2)	44 (± 7.0)	44 (± 12.5)
Enrichment in specific subject areas	59 (± 5.7)	50 (± 16.4)	60 (± 6.9)	60 (± 12.4)
Challenge use for high achievers	47 (± 5.8)	34 (± 15.5)	51 (± 7.1)	40 (± 12.4)
Computer literacy	46 (± 5.8)	48 (± 16.4)	45 (± 7.0)	47 (± 12.6)
Computer applications	19 (± 4.5)	16 (± 12.0)	17 (± 5.3)	24 (± 10.8)
Computer programming	25 (± 5.0)	16 (± 12.0)	23 (± 6.0)	34 (± 11.9)
Instruction for special education students	13 (± 3.9)	16 (± 12.0)	15 (± 6.0)	10 (± 7.6)
Bilingual instruction	1 (± 1.1)	3 (± 5.6)	1 (± 1.4)	1 (*)
Other	7 (± 2.9)	22 (± 13.6)	5 (± 3.1)	7 (± 6.4)
Number of cases	434	54	289	91

Note: (1) Figures in parentheses are the additions/subtractions necessary to establish a 90 percent confidence interval around the percentage estimate (i.e., 1.645 times the standard error of the estimate).

(2) The asterisk (*) signifies a positive percentage less than 0.5.

(3) Analysis restricted to about 582,000 teachers who used computers.

**Table 3.--Percent of teachers reporting computer use, by instructional purpose and district size:
School year 1982-83**

Purposes for computer use	Total	Size of district (number of pupils)				
		2,499 or less	2,500-4,999	5,000-9,999	10,000-24,999	25,000 and over
(In percent)						
Remedial instruction for regular classroom students	43 (± 5.4)	45 (± 10.5)	40 (± 13.7)	47 (± 12.0)	34 (± 12.2)	43 (± 12.6)
Regular instruction in specific subjects for all students	43 (± 5.4)	44 (± 10.4)	47 (± 14.0)	35 (± 11.5)	43 (± 12.8)	47 (± 12.7)
Enrichment in specific subject areas	59 (± 5.4)	57 (± 10.4)	63 (± 13.5)	64 (± 11.6)	58 (± 12.7)	57 (± 12.6)
Challenge use for high achievers	47 (± 5.5)	53 (± 10.5)	47 (± 14.0)	46 (± 12.0)	44 (± 12.8)	36 (± 12.2)
Computer literacy	46 (± 5.5)	44 (± 10.4)	46 (± 13.9)	42 (± 11.9)	50 (± 12.9)	50 (± 12.8)
Computer applications	19 (± 4.3)	23 (± 8.8)	12 (± 9.1)	20 (± 9.6)	13 (± 8.7)	20 (± 10.2)
Computer programming	25 (± 4.8)	26 (± 9.2)	22 (± 11.6)	26 (± 10.6)	19 (± 10.1)	28 (± 11.5)
Instruction for special education students	13 (± 3.7)	17 (± 7.9)	11 (± 8.8)	9 (± 6.9)	15 (± 9.2)	10 (± 7.7)
Bilingual instruction	1 (± 1.1)	1 (± 2.1)	4 (± 5.5)	<1 (± 2.4)	(*)	(*)
Other	7 (± 2.8)	5 (± 4.6)	11 (± 8.8)	5 (± 5.2)	7 (± 6.6)	14 (± 8.9)
Number of cases	481	131	74	100	87	89

Note: (1) Figures in parentheses are the additions/subtractions necessary to establish a 90 percent confidence interval around the percentage estimate (i.e., 1.645 times the standard error of the estimate).

(2) The asterisk (*) signifies a positive percentage less than 0.5.

(3) Analysis restricted to about 582,000 teachers who used computers.

Table 4.—Percent of teachers reporting computer use, by instructional purpose and district wealth: School year 1982-83

Purposes for computer use	Total	Wealth of district (per-pupil expenditure)			
		\$1,900 or less	\$1,901-\$2,301	\$2,302-\$2,736	\$2,737 and over
(In percent)					
Remedial instruction for regular classroom students	43 (± 6.0)	36 (± 14.9)	52 (± 12.1)	35 (± 11.3)	44 (± 10.6)
Regular instruction in specific subjects for all students	43 (± 6.0)	41 (± 15.3)	59 (± 12.0)	37 (± 11.4)	42 (± 10.5)
Enrichment in specific subject areas	59 (± 6.0)	71 (± 14.1)	64 (± 11.7)	68 (± 11.1)	46 (± 10.6)
Challenge use for high achievers	47 (± 6.1)	39 (± 5.2)	42 (± 12.0)	54 (± 11.8)	43 (± 10.6)
Computer literacy	46 (± 6.1)	49 (± 15.5)	43 (± 12.0)	39 (± 11.6)	44 (± 10.6)
Computer applications	19 (± 4.8)	13 (± 10.4)	19 (± 9.5)	23 (± 10.0)	17 (± 8.0)
Computer programming	25 (± 5.3)	26 (± 13.6)	26 (± 10.7)	14 (± 8.2)	31 (± 9.9)
Instruction for special education students	13 (± 4.1)	5 (± 6.8)	12 (± 7.0)	21 (± 9.7)	14 (± 7.4)
Bilingual instruction	1 (± 1.2)	2 (± 4.3)	2 (± 3.4)	(*)	2 (± 3.0)
Other	7 (± 3.1)	4 (± 6.1)	8 (± 6.6)	3 (± 4.0)	14 (± 7.4)
Number of teachers	388	60	98	103	127

Note: (1) Figures in parentheses are the additions/subtractions necessary to establish a 90 percent confidence interval around the percentage estimate (i.e., 1.645 times the standard error of the estimate).

(2) The asterisk (*) signifies a positive percentage less than 0.5.

(3) Analysis restricted to about 582,000 teachers who used computers.

(4) Wealth of district is defined as per-pupil expenditure, excluding capital outlay.